REMARKS

The Office Action dated August 11, 2003, indicated as being "FINAL" has been reviewed in detail and the application has been amended in the sincere effort to place the same in condition for allowance. Reconsideration of the claims of the application and allowance in their amended form are requested based on the following remarks.

Applicants retain the right to pursue broader claims under 35 U.S.C. §120.

Applicants have provided a unique solution with respect to problems regarding A FLAT PANEL LIQUID-CRYSTAL DISPLAY SUCH AS FOR A LAPTOP COMPUTER. Applicants' solution is now claimed in a manner that satisfies the requirements of 35 U.S.C. §103.

New Issues:

It is submitted that no new issues have been raised by this amendment and that the amendments to the claims have correspondence to limitations in the claims presently on file.

Telephonic Interview:

The undersigned would like to sincerely thank Examiner David Sample and Examiner Elizabeth Bolden for the courtesies extended

during a telephonic interview between the Examiner and the undersigned on December 10, 2003, and a subsequent telephonic interview on December 18, 2003.

In the telephonic interview of December 18, 2003, independent Claim 61 and the remaining prior art reference, U.S. Patent No. 6,169,047 (herein after U.S. '047) to Nishizawa, were primarily discussed.

An official agreement was not reached between the Examiners and the undersigned as to the allowability of Claim 61 over U.S. '047. However, the undersigned presented arguments that the present invention, as claimed in Claim 61, produces a surprising result that is not anticipated nor rendered obvious by U.S. '047. In general, the undersigned pointed out that Claim 61 recites a glass composition that is selected to provide a glass having a high transition temperature, T_g, and low temperatures at which the viscosity is 10^2 dPas and 10^4 dPas, which is not disclosed by U.S. '047. The Examiners indicated that such an argument would receive favorable consideration if set forth in an amendment, which argument is therefore presented herein below.

During the telephonic interview of December 10, 2003, two of

the applied references, U.S. Patent No. 6,417,124 (herein after U.S. '124) to Peuchert, and U.S. Patent No. 6,465,381 (herein after U.S. '381) to Lautenschläger, were discussed. In the discussion, the undersigned pointed out that the present application claims the benefit of priority to Federal Republic of Germany Patent Application No. 100 00 837 (herein after Germany '837). Germany '837 was filed on January 12, 2000, which is before the August 21, 2000 filing date of the application for U.S. '124, and the July 24, 2000 filing date of the application for U.S. '381. An agreement was therefore reached between the Examiner and the undersigned that U.S. '124 and U.S. '381 are not prior art against the present application, provided that a verified English translation of Germany '837 be submitted with the instant amendment. Accordingly, an English translation of Germany '837 and a Translator's Verification are submitted herewith.

In addition, the Examiners indicated the claims of the present application now would likely be rejected under the judicially-created doctrine of double patenting in view of U.S. '124 and/or U.S. '381, but could be overcome with a terminal disclaimer. This rejection is believed to be overcome for the reasons discussed in detail below

under a separate heading.

The telephonic interviews are further summarized below in the section entitled "Recordation of the Substance of the Telephonic Interview."

Rejection of Claims 61-80 Under 35 U.S.C. §103 in view of Nishizawa:

Claims 61-80 were rejected under 35 U.S.C. §103, as being unpatentable over Nishizawa et al., U.S. Patent No. 6,169,047.

Discussion of Nishizawa:

Nishizawa, as understood, shows a glass for use as a substrate glass for various displays. In the abstract, Nishizawa discloses very broad ranges for the components of the glass, which ranges are essentially a summary of all the possible amounts of each component disclosed in the examples. Nishizawa shows eleven tables, Tables 1 to 11, with a total of 46 examples of glass compositions. The glass components are expressed in terms of parts by weight on the oxide basis.

Claim 61:

Claim 61 states:

> "A glass comprising:
> a substantially alkali-free aluminoborosilicate glass;

said glass having the composition (in % by weight, based on oxide):

SiO_2	> 58 - 65
B_2O_3	> 6 - 11.5
Al_2O_3	> 14 - 25
MgO	4 - 8
CaO	0 - 8
SrO	2.6 - < 4
BaO	0 - < 0.5
with SrO + BaO	> 3
ZnO	0.5 - 2;

said composition of said SiO_2, said B_2O_3, said Al_2O_3, said MgO, said CaO, said SrO, said BaO, said SrO + BaO, and said ZnO being selected to provide all of (i.), (ii.), (iii.), and (iv.), wherein (i.), (ii.), (iii.), and (iv.) comprise:

(i.) a coefficient of thermal expansion $\alpha_{20/300}$ of between 2.8 x 10^{-6}/K and 3.8 x 10^{-6}/K;

(ii.) a glass transition temperature, T_g, of more than 713 degrees Celsius to maximize heat resistance of said glass;

(iii.) a temperature at a viscosity of 10^2 dPas of at most 1694 degrees Celsius; and

(iv.) a processing temperature, V_A, at a viscosity of 10^4 dPas of at most 1273 degrees Celsius.

Discussion of Temperatures:

Out of all 46 examples in Nishizawa, only Example 30 discloses SiO_2, B_2O_3, Al_2O_3, MgO, CaO, SrO, and BaO in amounts that fall within the ranges for each of these components as recited in Claim 61. However, Nishizawa also discloses that the glass of Example 30 reaches a viscosity of 10^2 poise (dPas) at 1710°C, and a viscosity of 10^4 poise at 1280°C. On the contrary, Claim 61 recites that the components of the glass are selected to provide "a temperature at a

viscosity of 10^2 dPas of at most 1694 degrees Celsius" and "a processing temperature, V_A, at a viscosity of 10^4 dPas of at most 1273 degrees Celsius." Claim 61 therefore recites a glass of which the composition of components is selected to provide a glass which achieves viscosity of 10^2 poise and 10^4 poise at a lower temperature than the glass having the composition of Example 30 of Nishizawa.

In addition, Nishizawa discloses that the glass in Example 30 has a strain point of 680°C. Claim 61 recites "a glass transition temperature, T_g, of more than 713 degrees Celsius to maximize heat resistance of said glass." Dr. Ute de Groot, a representative for the Applicants and an employee of the owner of the present application, namely, Schott Glas, indicated to the undersigned that the strain point for the glass of the present invention is about 25 degrees lower than the T_g temperature. Therefore, it is respectfully submitted that the strain point for the glass of Claim 61 is at least 688°C, which is 25 degrees lower than the T_g temperature of 713°C. Therefore, the calculated strain point of the glass of Claim 61, based on the T_g temperature, is, at its lowest, higher than the strain point of 680°C of the glass of Example 30 in Nishizawa.

The combination of the above properties is a surprising result.

As is well known in the glass art, modifying the glass to increase or decrease the strain point temperature or the T_g temperature expectedly results in a corresponding increase or decrease in the temperature at the 10^2 dPas and 10^4 dPas viscosities. All of the examples shown in Nishizawa evidence this teaching, as the temperature at a viscosity of 10^2 poise is higher than in other examples only when the strain point temperature is higher than in other examples. On the contrary, the present invention teaches that the glass components can be selected to provide a glass where the difference between the T_g temperature and the 10^2 dPas and 10^4 dPas viscosity temperatures is decreased when the T_g temperature is increased.

The present invention the glass as claimed in Claim 61, due to its specific composition and the specific ranges of the components, has **a high glass transition temperature, or T_g temperature**. A high T_g temperature of a glass provides a high heat resistance which is conducive to minimize damage to the glass due to thermal shock on the glass. This is extremely advantageous because a glass that can withstand high temperatures with very little or no damage can be used in a greater number and variety of commercial or industrial

applications. Applicants' glass has a high T_g temperature of more than 713°C.

Even though the claimed glass has a high T_g temperature of more than 713°C, due to the combination of the specific claimed ranges of the glass and the specific composition of Applicants' glass, the claimed glass also has both a **low melting temperature** and a **low hot shaping temperature**. As stated above, it is submitted that this combination is surprising and that a person skilled in the art would not expect this relationship, but rather the opposite, that is, that a high T_g temperature would result in both a high melting temperature and a high hot shaping temperature.

A low melting temperature is indicated by a low temperature at a viscosity of 10^2 dPas. Claim 61 recites a temperature of at most 1694°C at a viscosity of 10^2 dPas. A low hot shaping temperature, also referred to as processing temperature V_A, is indicated by a low temperature at a viscosity of 10^4 dPas. Claim 61 recites a temperature at a viscosity of 10^4 dPas of at most 1273°C.

The viscosities of 10^2 dPas or 10^4 dPas are desirable because glass melts of these viscosities are easier to work. Unfortunately, glasses with high strain points and/or T_g temperatures are not

expected to achieve these viscosities at low temperatures, and thus substantial time and energy are required to heat these glasses to high temperatures. On the contrary, the glass composition of Claim 61 achieves these desirable viscosities at lower temperatures than would be expected by a person skilled in the art for a glass having a high T_g temperature. As a result, the glass according to Claim 61 advantageously combines two properties that would not be expected to be combinable. The glass of Claim 61 has the desirable quality of high heat resistance, but can be produced at lesser expense than glasses of similar heat resistance because the glass does not need to be heated for as long or to as high a temperature to form a melt having a desired viscosity.

Claim 61 therefore also recites a glass where the composition is selected in order to decrease the difference between the T_g temperature and the temperatures at which the glass achieves a viscosity of 10^2 dPas and 10^4 dPas. As mentioned above, the glass according to Claim 61 has a T_g temperature of more than 713°C, a temperature at a viscosity of 10^2 dPas of at most 1694°C, and a temperature at a viscosity of 10^4 dPas of at most 1273°C. Therefore, the glass of Claim 61 has, <u>at the most</u>, a difference of

981 degrees between the T_g temperature and the temperature at 10^2 dPas, and a difference of 560 degrees between the T_g temperature and the temperature at 10^4 dPas.

Further, as discussed above, the difference between the T_g temperature and the strain point of the glass of Claim 61 is about 25 degrees. Therefore the difference between the strain point and the temperatures at the two viscosities is about 25 degrees more. The glass of Claim 61 has, at the most, a difference of 1006 degrees between the strain point temperature of 688°C and the temperature at 10^2 dPas of at most 1694°C, and a difference of 585 degrees between the strain point temperature of 688°C and the temperature at 10^4 dPas of at most 1273°C.

It should be noted that these calculations evidence the maximum difference between the various temperatures. It is desirable though, as discussed above, to decrease this difference so that the glass combines the advantageous properties of high heat resistance and good meltability and workability at low temperatures. Thus, the components of the glass according to Claim 61 could be selected to produce a glass having a shorter distance between the various temperatures.

On the contrary, Example 30 in Nishizawa recites a strain point of 680°C, a temperature at 10^2 poise of 1710°C, and a temperature at 10^4 poise of 1280°C. The glass of Example 30 has a difference of 1030 degrees between the strain point temperature and the temperature at 10^2 dPas, and a difference of 600 degrees between the strain point temperature and the temperature at 10^4 dPas. Therefore, the glass of Example 30 has a difference between the strain point temperature and the temperature at 10^2 dPas that is 24 degrees greater (1030°C-1006°C=24°C) than the maximum difference of Claim 61. The glass of Example 30 also has a difference between the strain point temperature and the temperature at 10^4 dPas that is 15 degrees greater (600°C-585°C=15°C) than the maximum difference of Claim 61. Claim 61 therefore recites a glass composition that is selected to provide differences between the strain point temperature and the temperatures at viscosities of 10^2 dPas and 10^4 dPas, which, at the most, are less than the differences between these temperatures in Example 30 of Nishizawa.

Claim 61 therefore distinguishes over and is not rendered obvious by Nishizawa as no example in Nishizawa teaches or suggests a composition having components in amounts that fall within

the recited ranges **and** that are selected to provide "a temperature at a viscosity of 10^2 dPas of at most 1694 degrees Celsius" and "a processing temperature, V_A, at a viscosity of 10^4 dPas of at most 1273 degrees Celsius."

Glass Art is Unpredictable:

It is also submitted that the glass art is an unpredictable art. Thus, if a person of skill in the art were to make any change in the composition of a glass, he or she could not unquestionably predict the effects the change in composition would have on the glass and its properties. Further, what may appear to be a predictable outcome regarding glass compositions is in reality not predictable, and any appearance of predictability in this case is based on the use of hindsight, which is improper in determining obviousness.

Discussion of ZnO Content:

In addition to the above distinctions, Nishizawa also does not teach or suggest a composition having all of the components of the glass according to Claim 61 that fall within the ranges of Claim 61. To further explain, Example 30 of Nishizawa sets forth the amounts of the following components: SiO_2, B_2O_3, Al_2O_3, MgO, CaO, SrO, and BaO. The amount of ZnO, if any, is not mentioned. On the

contrary, Claim 61 clearly recites a zinc oxide content of from 0.5 wt% to 2.0 wt%.

However, there is a brief reference to ZnO in the disclosure of Nishizawa, in column 4, lines 30-44, as follows:

> "In the glass of the present invention, in addition to the above components, ZnO may be incorporated in a total amount of at most 5 mol %, in order to improve the melting property, the clarity and the forming property of the glass."

Nishizawa therefore teaches that ZnO can be optionally added to the glass. It can therefore be reasonably concluded that the glass of Example 30 could possibly contain an amount of ZnO that was not mentioned specifically in the example. Based on this conclusion, the undersigned added up the percentage amounts for the components listed in Example 30. The total of these percentages was 99.9 wt%. Therefore, only 0.1 wt% of the composition could be components other than those listed. An optional component such as ZnO therefore could not exceed 0.1 wt%. This amount is outside the range of 0.5 wt% to 2.0 wt% for ZnO set forth in Claim 61.

It is therefore respectfully submitted that Claim 61 distinguishes over and is not made obvious by Nishizawa because Nishizawa does not teach or suggest a glass composition having component amounts in the ranges set forth in Claim 61.

Discussion of the Abstract of Nishizawa:

It is also recognized that the abstract of Nishizawa discloses very broad ranges for the chemical components of the various glasses of Nishizawa, which broad ranges encompass the component ranges set forth in Claim 61. ZnO is not discussed in the abstract. It is respectfully submitted that these broad ranges are simply a summary of the ranges of the components disclosed in the 46 examples and elsewhere in Nishizawa. There is no specific teaching of any specific type of glass or glass composition in the abstract of Nishizawa. The abstract simply sets forth the minimum and maximum amounts of each component from the specification of Nishizawa for the convenience of the reader.

In addition, the abstract of Nishizawa does not address the temperatures at which the glass reaches the viscosities of 10^2 dPas and 10^4 dPas. These properties are only disclosed in the examples of Nishizawa.

In view of the above, reconsideration and withdrawal of the present rejection is respectfully requested.

Rejection of Claims 61-80 Under 35 U.S.C. §103 in view of Peuchert:

Claims 61-80 were rejected under 35 U.S.C. §103, as being unpatentable over Peuchert et al., U.S. '124. This rejection is believed to have been rendered moot as agreed to in the telephonic interview of December 10, 2003 for the reasons discussed above. Reconsideration and withdrawal of the present rejection is therefore respectfully requested.

Rejection of Claims 64, 69-73, 75, and 78-80 Under 35 U.S.C. §103 in view of Lautenschläger:

Claims 64, 69-73, 75, and 78-80 were rejected under 35 U.S.C. §103, as being unpatentable over Lautenschläger et al., U.S. '381. Claims 64-80 have been canceled herein, without prejudice, thereby rendering the present rejection moot. This rejection is also believed to have been rendered moot as agreed to in the telephonic interview of December 10, 2003 for the reasons discussed above. Reconsideration and withdrawal of the present rejection is therefore respectfully requested.

Potential Double-patenting Rejection:

As mentioned above, both Peuchert et al., U.S. '124, and

Lautenschläger et al., U.S. '381, are not prior art against the present application as their respective U.S. filing dates do not precede the earliest priority date for the present application. However, the Examiner indicated that these references would likely be used as the basis for a double-patenting rejection of the claims against which these references were applied. In order to overcome such a rejection, a Terminal Disclaimer and fee are being submitted herewith. The filing of this Terminal Disclaimer is believed to overcome a potential double-patenting rejection of Claims 61-63 in view of U.S. '124.

The Terminal Disclaimer does not relate to U.S. '381. U.S. '381 was used to reject only Claims 64, 69-73, 75, and 78-80, which claims have been canceled herein without prejudice. Since these claims have been canceled, it is respectfully submitted that any potential double-patenting rejection based on U.S. '381 against these claims is rendered moot.

Recordation of the Substance of the Telephonic Interview:

In order to render this Amendment complete, the following is a recordation of the substance of the telephonic interviews conducted with the Examiners on December 10, 2003, and December 18, 2003:

December 10, 2003:

1) No exhibits were shown, nor were any demonstrations conducted.

2) Primarily, the prior art discussed Peuchert et al., U.S. '124, and Lautenschläger et al., U.S. '381.

3) Applicant's representative essentially proposed that U.S. '124 and U.S. '381 were not prior art against the present application.

4) Generally no other pertinent matters were discussed.

5) The general outcome of the interview was an agreement between the Examiner and the Applicant's representative that U.S. '124 and U.S. '381 would not be considered prior art against the present application, provided that a verified translation of the foreign priority document be submitted to perfect the priority claim. The Examiner also requested that a Terminal Disclaimer be filed to overcome a potential double-patenting rejection.

December 18, 2003:

1) No exhibits were shown, nor were any demonstrations conducted.

2) Primarily, independent Claim 61 was discussed.

3) Primarily, the prior art discussed was U.S. Patent No.

6,169,047 to Nishizawa.

4) Applicant's representative essentially proposed to present arguments in the manner set forth in this Amendment.

5) Generally, Applicant's representative submitted, inter alia, that the prior art discussed did not teach nor suggest nor make obvious the present invention as claimed in Claim 61 for the reasons discussed herein.

6) Generally no other pertinent matters were discussed.

7) The general outcome of the interview was no official agreement between the Examiner and the Applicant's representative that the claims would be allowable over the prior art discussed. However, the Examiner indicated that such arguments as those presented herein would likely receive favorable consideration.

Art Made of Record:

The prior art made of record and not applied has been carefully reviewed, and it is submitted that it does not, either taken singly or in any reasonable combination with the other prior art of record, defeat the patentability of the present invention or render the present invention obvious. Further, Applicants are in agreement with the Examiner that the prior art made of record and not applied does not

appear to be material to the patentability of the claims currently pending in this application.

In view of the above, it is respectfully submitted that this application is in condition for allowance, and early action towards that end is respectfully requested.

Summary and Conclusion:

It is submitted that Applicants have provided a new and unique A FLAT PANEL LIQUID-CRYSTAL DISPLAY SUCH AS FOR A LAPTOP COMPUTER. It is submitted that the claims are fully distinguishable from the prior art. Therefore, it is requested that a Notice of Allowance be issued at an early date.

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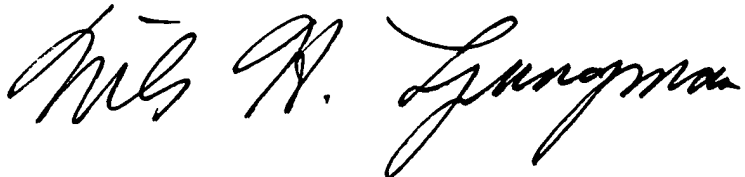
Respectfully submitted,



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